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EXAMINER	
BODDIE, WILLIAM	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/691,312	Applicant(s) LEE ET AL.
	Examiner William L. Boddie	Art Unit 2629

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 16-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-23* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/13/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, January 7th, 2008 the Applicants amended claims 1-2, 12 and 19. Currently claims 1-14 and 16-23 are pending.

Response to Arguments

2. Applicant's arguments filed January 7th, 2007 have been fully considered but they are not persuasive.

3. On pages 6-9 of the remarks, the Applicants traverse the rejection of claims 1-14 and 16-23. Specifically the Applicants argue that none of the currently cited art teaches the newly added limitations.

4. The Examiner respectfully disagrees. All the newly added limitations are similar in scope, in that they all require that the second display color is retrieved using image information corresponding to the first color. It seems clear to the Examiner that D'Souza discloses just such a limitation. For further discussion please see each claim's newly updated rejection below.

Claim Objections

5. Claim 12 is objected to because of the following informalities: line 11 states "the retrieved the gray scale." This statement is grammatically incorrect. Appropriate correction is required. One suggestion is to replace "the retrieved the gray scale" with 'the retrieved gray scale'.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 19 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of D'Souza et al. (US 7,046,255).

With respect to claim 19, Yui discloses, a method of driving a display device (6 in fig. 1), comprising:

receiving image information (1 in fig. 4), the image information including a gray scale value corresponding to a first color (red; S4 in fig. 2a) displayable by the display device (input data in fig. 6);

determining whether the gray scale value is greater than a predetermined corresponding gray scale level at which the first color is displayable by the display device (col. 2, lines 43-45; also note the color space comparisons made by the controller in col. 4, lines 39-67);

applying the image information to the display device if it is determined the gray scale value is not greater than the predetermined corresponding gray scale level (col. 4, line 59 - col. 5, line 11); and

compensating the image information if it is determined the gray scale value is great than the predetermined corresponding gray scale level (col. 5, lines 5-11), wherein compensating the image information includes compensating a gray scale value for the first color displayable by the display device (S5 in fig. 2a) and supplying a gray scale value for a second color (green, s6 in fig. 2a) displayable by the display device (col. 4, line 48 – col. 5, line 11).

Yui does not expressly disclose wherein the gray scale data for the second display color is retrieved using the gray scale value of the image received image information corresponding to the first color displayable by the display device.

D'Souza discloses, compensating image information (input R,G,B in fig. 2) by compensating a gray scale value for a first color displayable by a display device (240 in G'" in fig. 5; for example) and supplying a gray scale value for a second color displayable by the display device (84 in R'" in fig. 5; for example), and wherein the gray scale data for the second display color is retrieved using the gray scale value of the image received image information corresponding to the first color displayable by the display device (508 in fig. 5; fig. 2; note that the data for each color is supplied to all of the filters and lookup tables. Figure 5 demonstrates that all the colors are compensated based on each other's color reproducibility).

D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

With respect to claim 21, Yui and D'Souza disclose, the method of claim 19 (see above).

Yui further discloses, wherein the first color is at least one of a red, green, and blue color (clear from figs. 6c1-2).

With respect to claim 22, Yui and D'Souza disclose, the method of claim 19 (see above).

Yui further discloses, wherein the predetermined corresponding gray scale level corresponds to a gray scale level of the first color displayable by the display device, wherein the color is displayable by the display device, wherein the color is displayable at a reduced color reproducibility (col. 4, lines 64-67).

With respect to claim 23, Yui and D'Souza disclose, the method of claim 19 (see above).

Yui further discloses, storing gray scale values of the 52^{nd} to the 64^{th} gray scale (col. 5, lines 1-5) level in the lookup table (3,9 in fig. 1).

Yui does not expressly disclose, mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses, mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.).

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

8. Claims 1-14 and 16-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of D'Souza et al. (US 7,046,255) and further in view of Kimura et al. (US 6,008,786).

With respect to claim 1, Yui discloses, a display device (6 in fig. 1), comprising:

a display panel (6 in fig. 4),

a lookup table (9 in fig. 4) to store a gray scale value (output data in figs. 6a2-c2; col. 3, lines 58-65) corresponding to a predetermined grayscale level (input data in figs. 6a2-6c2; col. 3, lines 33-58) of a first displayable color (red for example in fig. 2a);

a data processing unit (3 and 7 in fig. 4) that retrieves a grey scale value from the lookup table using input data for the first displayable color (display profile and lookup table are retrieved to determine the display color space; col. 4, lines 33-35), that determines from the retrieved gray scale value whether color reproducibility for the first displayable color is reduced (this information is compared with the host color space input data; col. 4, lines 26-33), and that based on the determination compensates the input data for the first displayable color (figs. 5a-c disclose the different determinations; col. 4, lines 39-67 disclose the compensation for each determination) and supplies gray scale data for a second displayable color to produce compensated image information (s6 in fig. 2a for example); and

a data driving unit (5 in fig. 1) for receiving the compensated image information and for applying the compensated image information to the display panel (col. 2, lines 45-48).

Yui does not expressly disclose wherein the gray scale data for the second display color is retrieved using the gray scale value of the image received image information corresponding to the first color displayable by the display device.

D'Souza discloses, compensating image information (input R,G,B in fig. 2) by compensating a gray scale value for a first color displayable by a display device (240 in G'" in fig. 5; for example) and supplying a gray scale value for a second color displayable by the display device (84 in R'" in fig. 5; for example), and wherein the gray scale data for the second display color is retrieved using the gray scale value of the image received image information corresponding to the first color displayable by the display device (508 in fig. 5; fig. 2; note that the data for each color is supplied to all of the filters and lookup tables. Figure 5 demonstrates that all the colors are compensated based on each other's color reproducibility).

D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

Neither D'Souza nor Yui expressly disclose, that the display panel is a LCD panel with the requisite control circuitry.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48);

a gate driving unit to apply scan signals to the plurality of gate lines (5 in fig. 1).

Kimura, D'Souza and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui and D'Souza with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 2, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the predetermined gray scale level corresponds to a gray scale level of the displayable color prior to a reduction in a reproducibility of the first displayable color (clear from figs. 6a-c; also note col. 4, lines 57-67).

With respect to claim 3, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the stored gray scale value is a maximum gray scale value,

wherein the maximum gray scale value is the gray scale value corresponding to the maximum gray scale level displayable by the LCD panel for which the color reproducibility of the first displayable color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel).

With respect to claim 4, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the first displayable color includes a blue color (clear from figs. 6c1-2).

With respect to claim 5, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the first displayable color is displayable at a plurality of grayscale levels (as a result of the clipping, there is clearly a displayable color that is displayable at a plurality of grayscale levels).

With respect to claim 6, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the lookup table stores grayscale values of a blue color (clear from figs. 6c1-2).

With respect to claim 7, Yui, D'Souza and Kimura disclose, the device of claim 6 (see above).

Neither D'Souza nor Yui expressly disclose the use of 64 gray scale levels.

Kimura discloses, a lookup table that stores gray scale values each corresponding to one of 64 gray scale levels of a blue color (col. 4, lines 38-44; and col. 1, lines 52-56).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the 256 level gray scale of Yui and D'Souza with the 64 level gray scale of Kimura for the benefit of cost.

With respect to claims 8 and 9, Yui, D'Souza and Kimura disclose, the device of claim 7 (see above).

While Yui discloses a 256 level gray scale instead of a 64 level gray scale, as shown above it would have been obvious to use a 64 level gray scale.

It is clear from figures 6A-2-6C-2 of Yui that once the input gray scale levels reach a certain level (based on the reproducibility of the device), that level is maintained until the maximum gray scale level.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 51^{st} gray scale level. If the color reproducibility required that the gray scale be clipped at the 51^{st} level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 51^{st} level in the current invention, there does not appear to be any reason for specifically selecting the 51^{st} level versus the 50^{th} or 49^{th} levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui

discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claims 8 and 9.

With respect to claim 10, Yui, D'Souza and Kimura disclose, the device of claim 1 (see above).

Yui further discloses, wherein the lookup table stores gray scale values of blue, red and green colors (clear from figs. 6a2-c2).

With respect to claim 11, Yui, D'Souza and Kimura disclose, the device of claim 10 (see above).

Yui further discloses, storing gray scale values of the 52^{nd} to the 64^{th} gray scale (col. 5, lines 1-5) level in the lookup table (3,9 in fig. 1).

Neither Yui nor Kimura expressly disclose, mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses, mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.).

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui and Kimura.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

With respect to claim 12, Yui discloses, a method for improving a color reproducibility (fig. 2) of a display device (6 in fig. 4), comprising:

increasing a gray scale value of at least one of a red (R), green (G), and blue (B) color (clear from differences from fig. 6a1-c1 to fig. 6a2-c2);

detecting a grayscale value at which a color reproducibility of the LCD device is reduced (col. 4, lines 59-67; also see fig. 6a1-c2);

storing a correspondence of the detected gray scale value and a predetermined gray scale level of a displayable color (col. 5, lines 1-5);

compensating a received image information, the received image information including the detected gray scale value (col. 4, lines 26-38) for the displayable color and retrieved gray scale values for at least one other color different from the displayable color to enhance the reproducibility of the first displayable color (clear from figs. 5a-c that all of the colors, R,G,B are analyzed); and

applying the compensated image information to the display device (6 in fig. 4), the compensated image information including the maximum gray scale value,

wherein the maximum gray scale value is the gray scale value corresponding to the maximum gray scale level displayable by the display panel for which the color reproducibility of the display able color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel; also specifically note col. 4, lines 64-67), and

wherein detecting includes measuring the gray scale level of a color displayed by the display panel (quite clear that the gray scale level displayed by the display panel is

measured, this is evidenced by the display color space data (21 in fig. 4 and fig. 5; col. 4, lines 27-67) and the exact clipping of the output gray scale levels when they are no longer reproducible by the display. It is unclear to the Examiner as to how the display color space data and the exact clipping would be performed without any measurements of the gray scale level displayed by the display panel.).

Yui does not expressly disclose wherein the gray scale values for the at least one other color are retrieved from a lookup table using the gray scale value for the displayable color of the received image information.

D'Souza discloses, compensating received image information (input R,G,B in fig. 2) by compensating a gray scale value for a first color displayable by a display device (240 in G'" in fig. 5; for example) and supplying a gray scale value for at least one other color, different from the displayable color, displayable by the display device (84 in R'" in fig. 5; for example), and wherein the gray scale data for the second display color is retrieved using the gray scale value of the image received image information corresponding to the first color displayable by the display device (508 in fig. 5; fig. 2; note that the data for each color is supplied to all of the filters and lookup tables. Figure 5 demonstrates that all the colors are compensated based on each other's color reproducibility).

D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

Neither D'Souza nor Yui expressly disclose, that the display panel is a LCD panel with the requisite control circuitry.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 13, as claim 13 recites identical limitations as claim 2, claim 13 is rejected on the same merits as shown above in claim 2.

With respect to claim 14, as claim 14 recites identical limitations as claim 3, claim 14 is rejected on the same merits as shown above in claim 3.

With respect to claim 16, as claim 16 recites identical limitations as claim 4, claim 16 is rejected on the same merits as shown above in claim 4.

With respect to claim 17, as claim 17 recites identical limitations as claim 8, claim 17 is rejected on the same merits as shown above in claim 8.

With respect to claim 18, as claim 18 recites identical limitations as claim 9, claim 18 is rejected on the same merits as shown above in claim 9.

With respect to claim 20, Yui and D'Souza disclose, the method of claim 19 (see above).

Yui further discloses, applying compensated image information to the display device (5 in fig. 4).

Neither D'Souza nor Yui expressly disclose, that the display panel comprises a plurality of data lines.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48) and applying compensated image information to the plurality of data lines (lines exiting X-driver; 3 in fig. 1).

Kimura, D'Souza and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui and D'Souza with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption and fast response (Kimura; col. 1, lines 16-20).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
2/5/08

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SUPERVISORY PATENT EXAMINER